

by Cuming in "Monte Christi, west Colombia," That species, however, is olive-brown in color instead of black and the columella is said to have four plaits. *M. zaca* has a trace of a fifth. Reeve's figure shows fairly strong spiral lines on the shoulder and on the base whereas in *zaca* they are uniformly fine all over except near the columella where they are slightly stronger.

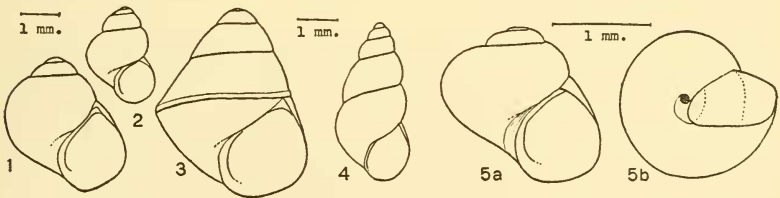
WESTERN AND SOUTHWESTERN AMNICOLIDAE AND A NEW HUMBOLDTIANA

BY H. A. PILSBRY

Potamopyrgus cheatumi, new species. Fig. 4.

The shell is imperforate, long-conic, brownish olive to grayish olive, the early whorls white by erosion of the surface. Surface rather dull, where unworn showing very weak lines of growth, usually scarcely visible. The whorls are strongly convex. The aperture is ovate, contained about three times in the length in large specimens, relatively larger in immature shells. The columella is slightly thickened, spreading a little in the umbilical region. Parietal callus thin, adnate. Length 3.75 mm., diam. 1.75 mm., aperture 1.3 mm.; $5\frac{1}{2}$ whorls.

Phantom Lake, near Toyahvale, Reeves Co., Texas. Type 163888 ANSP., collected by Prof. E. P. Cheatum.



This Hydrobia-like species is referred to *Potamopyrgus* for the reason that it is viviparous, an example opened containing several young with shells about 0.4 mm. in diameter, of $1\frac{2}{3}$ whorls. It is a far larger shell than *Paludestrina diaboli* P. & F., which moreover, is distinctly umbilicate. *Hydrobia seemanni* Ffd. is more similar, but it is distinct by the more slender shape and smaller mouth.

Cochliopa texana, new species. Figs. 5a, 5b.

The shell is minute, umbilicate, turbinate; olive to olive-brown, the first $1\frac{1}{2}$ whorls white or nearly so. Whorls $3\frac{1}{3}$, convex, the

last evenly rounded peripherally. Suture rather deeply impressed. Sculpture of very weak growth lines, not everywhere visible. Umbilicus narrow within, somewhat funnel-shaped in the last whorl, bounded by an angle which defines a lunate, excavated area behind the columellar lip. The aperture is oblique, broadly ovate, subangular posteriorly. Columellar margin adnate to the preceding whorl for only a short distance, thickened within, far less arcuate than the outer margin. Length 1.45 mm., diam. 1.5 mm.

Phantom Lake near Toyahvale, Reeves Co., Texas. Type 163887 ANSP., collected by Prof. E. P. Cheatum.

This is a smaller species than *C. riograndensis* P. & F., is less depressed, and has a far smaller umbilicus. It is nearly related to *C. rowelli* (Tryon) of Panamá, but that is a much larger shell, similar in conformation of the umbilicus.

It is likely that my *Fluminicola chihuahua* is really an aberrant *Cochliopa*; the umbilicus is like that of *C. texana*.

Fluminicola avernalis, new species. Fig. 1.

The shell is imperforate, somewhat rhombic in frontal outline, with short spire of about 4 whorls, the last rounded, the base impressed in the umbilical region. Aperture large, subrhombic, the parietal callus and the columella thick. Length 3.4 mm., diam. 3.1 mm., aperture 2.1 mm. long. A paratype is 4.25 mm. long.

Colorado Desert, California, with *Tryonia clathrata* Stimps., 40 specimens, most of them young or half grown. Type 27784 ANSP. These shells have been in the collection of the Academy about sixty or seventy years. They were labelled "Amnicola (*Fluminicola*?) n. sp.," with no more definite locality than "Colorado Desert." Two broken specimens of *Tryonia clathrata* were wedged in the apertures of the *Fluminicolae*. All of the shells are polished by blowing sand. They are presumably of Pleistocene age. I refrained from describing them before in the expectation that exactly localized examples would turn up, but it seems best to direct attention to them now, as some of the California conchologists may thereby be induced to look for the species.

Dr. R. E. C. Stearns (1901: Proc. U. S. N. Mus. vol. 24, p. 285) stated that he detected an example of *Fluminicola columbiana* among *P. protea* from the Colorado Desert. Probably what he

found was the species here described, as *F. columbiana* lives nearly 1000 miles further north.

Fluminicola avernalis carinifera, new subspecies. Fig. 3.

The imperforate, rhombic shell has about the shape of *Nitocris carinata* (Brug.). Spire short, obtuse, of fully 4 whorls, which are only very slightly convex; the last whorl nearly flat above, weakly convex below a strong peripheral keel, which weakens near the outer lip. The aperture is ovate, parietal callus thin, columella thick. Length 4.9 mm., diam. 4 mm., aperture 2.5 mm. long.

With the preceding. Type 164091 ANSP. Whether this is a distinct species or a carinate variation of the preceding cannot be decided until more material is turned up; but as only one was found among 40 *avernalis*, I am leaving it as a variety of that.

Hydrobia greggi, new species. Fig. 2.

The small, conic shell is umbilicate, with rather obtuse summit; dull green; composed of 4 whorls joined by a very deeply impressed suture. The surface is nearly smooth. Aperture broadly oval, narrower in the posterior part but not angular there. Peristome continuous but adnate above for a short distance, the outer margin thin; columella distinctly calloused; parietal margin thickened in old shells. Length 2.3 mm., diam. 1.8 mm., aperture 1.1 mm.

Cliff Creek canyon, a fork of Hoback canyon, about 29 miles south of Jackson, Wyoming, in the Snake River drainage. Type 163812 ANSP., collected by Dr. W. O. Gregg.

With the very convex whorls and general appearance of a *Hydrobia*, this snail has a distinctly thickened columella. The spire is more developed and the sutures deeper than in any *Fluminicola*. The small *Fluminicolae*, such as *F. turbiniformis*, have the columellar and parietal callus thicker, the spire much shorter. I do not know of any closely related species in the region.

Humboldtiana cheatumi, new species.

The globose shell is light yellow with blackish carob-brown bands, the upper and lower ones at least twice the width of the middle band. Very weak traces of granulation are visible in places on the spire, becoming obsolete or nearly so on the last half whorl; otherwise there are rather coarse wrinkles along lines of growth only. The peristome is somewhat expanded in the

basal curve, becoming broadly, triangularly reflected above, more than half concealing the umbilicus. Height 29 mm., diam. 33.5 mm.; 4 whorls.

From a small canyon near Ft. Davis, Davis Mountains, Texas. Type 164095 ANSP., collected by Prof. E. P. Cheatum. Paratypes in his collection.

Of the other species described from the Davis Mountains, *H. palmeri* Clench & Rehder is distinctly granulose throughout the last whorl except around the umbilicus. It is also much smaller, and the bands are subequal. In *H. ferrissiana* Pils. the last whorl is more depressed, the aperture more oblique, the middle band as wide as its fellows, and there is no granulation.

WEST AMERICAN SPECIES OF GONIOBASIS, WITH DESCRIPTIONS OF NEW FORMS

JUNIUS HENDERSON

Mrs. Henderson and I have collected *Goniobasis* at many localities in the Pacific States, and have spent a great deal of time in critically studying the large collections of them in the University of Colorado Museum and at Stanford University (especially the Hemphill and Hannibal collections), representing altogether about 200 localities. This study has led to the following conclusions:

1. Typical *Goniobasis silicula* (Gould) seems to be confined to western Washington, though material from Oregon and even California has been reported under that name by myself and others, through lumping with it several recognizable named forms. *G. s. bairdiana* Lea appears to be the prevailing form of this species in northwestern Oregon, usually easily distinguished. *G. s. rudens* Reeve is a recognizable variety, apparently represented by some of Hemphill's material from Olympia, at Stanford University.

2. *G. silicula shastaensis* Lea was originally described as having come from the Shasta and Scott Rivers, California, and Fort Umpqua, Oregon. I have seen no *Goniobasis* from the Scott River, and none from the Shasta River or the Klamath drainage that fits the description and figure of *shastaensis*, but we have